

# PATENT ABSTRACTS OF JAPAN

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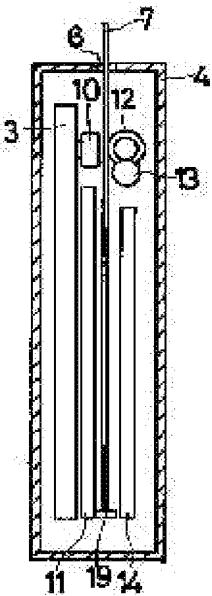
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## (54) INFORMATION PROCESSOR

(57)Abstract:

**PURPOSE:** To provide a miniaturized formation processor.  
**CONSTITUTION:** A liquid crystal display 3 and a printing section 18 are arranged in one housing 4. The printing section 18 is arranged oppositely to the surface of the liquid crystal display 3 and a thermal head 10 constituting the printing section 18 has width corresponding to one line of a thermal recording paper 7 and a plurality of heating elements are arranged, in single or a plurality of rows, in the breadthwise direction thereof. The thermal head 10 performs printing based on a dot image data being employed in display control of the liquid crystal display 3. Since no memory is required for print control, electrical constitution is simplified and the information processor is downsized and since a mechanism for driving the thermal head 10 in the line direction of recording paper is not required, the information processor is further downsized.



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## CLAIMS

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### [Claim(s)]

[Claim 1] In an information processor characterized by comprising the following, a liquid crystal display and a printer are allocated in the same housing. An information processor which makes it with the feature that allocate a printer in an opposite hand and a printhead is provided with two or more dot arrangement objects which cover the crosswise length of a recording form and are located in a line with it a display surface of a liquid crystal display.

An input means which directs at least execution of processing to an input and input of information defined beforehand.

A processing means to memorize input, to answer an output from an input means, and to perform processing to input defined beforehand.

A liquid crystal display which displays input and a processing result by said processing means at least.

A printer which prints input and a processing result by said processing means on a recording form based on directions from an input means.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Industrial Application] This invention relates to the information processor carried out suitably for a personal computer, a word processor, etc.

#### [0002]

[Description of the Prior Art] In recent years, the miniaturization of composition is also demanded with the request of as opposed to [ in connection with the increase in the diffusion rate ] improvement in throughput or large-scale-izing in information processors, such as a personal computer and a word processor. The necessity of checking input and a processing result visually immediately in an information processor to the display is indispensable. As for the display, the miniaturization is realized by development of a liquid crystal display etc.

[0003] Furthermore with an information processor, the printer which prints input and a processing result on a recording form is provided. Since frequency in use is low compared with a display, a printer has many external \*\*\*\*\* cases as an ancillary device.

#### [0004]

[Problem(s) to be Solved by the Invention] It is difficult to constitute the small information processor which includes a printer in one from a conventional information processor as mentioned above, since a display and a printer are separate devices. It is one of the means for realization of a miniaturization of composition to constitute a display and a printer in one.

[0005] The purpose of this invention is to provide the information processor with which composition

is miniaturized.

[0006]

[Means for Solving the Problem] An information processor this invention is characterized by that comprises the following.

An input means which directs at least execution of processing to an input and input of information defined beforehand.

A processing means to memorize input, to answer an output from an input means, and to perform processing to input defined beforehand.

A liquid crystal display which displays input and a processing result by said processing means at least.

In an information processor which includes a printer which prints input and a processing result by said processing means on a recording form based on directions from an input means, Two or more dot arrangement objects which a liquid crystal display and a printer are allocated in the same housing, a printer is allocated in an opposite hand with a display surface of a liquid crystal display, and a printhead covers the crosswise length of a recording form, and are located in a line.

[0007]

[Function] If this invention is followed, a liquid crystal display and a printer will be provided in the same housing, and, as for the display surface of a liquid crystal display, a printer will be allocated in an opposite hand. By making into one-line (one line) width the printhead which constitutes a printer, it is not necessary to move a head during printing operation like the printhead of a dot printer or a thermal transfer printer at a line writing direction, and becomes unnecessary [ the drive mechanism for it ], and the composition of a printer can be simplified. Thin-type-izing of a liquid crystal display and a printhead is possible by development of a thin film technology in recent years.

[0008] Since printing to the recording form what is called by a hard copy method using the printhead which has 1 linewidth is performed in the information processor of this invention, Based on the bit image data for one display screen used for the display driving of a liquid crystal display, what is necessary is just to drive the dot arrangement object of a printhead, and it is possible to share a drive circuit between a liquid crystal display and a printer, and the miniaturization of composition can be attained also at this point.

[0009]

[Example] Drawing 1 is a perspective view of the information processor 1 which is one example of this invention. The information processors 1 are a word processor and a personal computer, for example. The information processor 1 is provided with the keyboard 2 which directs the input of information, and execution of various processing, and the liquid crystal display 3 in which input, the processing result after information processing, etc. are displayed.

[0010] The liquid crystal display 3 is allocated in the housing 4. The printing unit 18 mentioned later is allocated in the opposite hand with the display surface of the liquid crystal display 3. The record paper insertion mouth 6 which inserts the recording form 7 is formed in the upside surface part of the housing 4, and the recording form rope release lever 8 and the record paper insertion lever 9 are formed in the right lateral part of the housing 4. With the connecting shaft 5, to the main part 1a, the housing 4 is formed in the arrow R1 and an arrow R 2-way so that angular displacement is possible.

[0011] When not using the information processor 1, angular displacement is carried out to an arrow R 2-way, and it changes into what is called the state that the keyboard 2 and the display surface of the liquid crystal display 3 counter where it closed. When using the information processor 1, angular displacement of the housing 4 is carried out in the arrow R1 direction, and it is used as what is called an open state. Gradually or continuously, fixed setting out is possible for the installation angle of the housing 4 to the main part 1a, and it can be used with the installation angle of an operator's request, being able to fix within limits defined beforehand.

[0012] Drawing 2 is a top view of the housing 4.

Drawing 3 is a front view of the housing 4, drawing 4 is a sectional view of the housing 4, and drawing 5 is a perspective view showing the composition of the printing unit 18.

The display surface of the liquid crystal display 3 is an opposite hand, and the printing unit 18 is allocated in the record paper insertion mouth 6 neighborhood. The printing unit 18 is constituted including the printing roller 12 which compresses and conveys the recording form 7, and the pulse motor 13 which rotates the roller 12 between the thermal head 10 which prints on the recording form 7, and the thermal head 10 energized by energizing means, such as a spring which is not illustrated.

[0013]The thermal head 10 has the width for one line of the recording form 7, and the heating resistor of one row or plural lines is formed along the cross direction. The contact and estrangement to the roller 12 of the thermal head 10 are controlled by the above-mentioned recording form rope release lever 8. The torque of the pulse motor 13 is transmitted to the axis of rotation 17 of the printing roller 12 via the gears 15 and 16.

[0014]The detail-paper-guide board 11 is allocated in the drawing 4 lower part side of the thermal head 10 along with the liquid crystal display 3. The control circuit board 14 is allocated by the position which counters on both sides of the recording form 7 of the detail-paper-guide board 11. The display control circuit of the liquid crystal display 3, the printing control circuit of the printing unit 18, etc. are established in the control circuit board 14. It is provided slidably, and the recording form support plate 19 which \*\*\*\* the end position of the recording form 7 is interlocked with the above-mentioned record paper insertion lever 9, and slides on the detail-paper-guide board 11.

[0015]Drawing 6 is a block diagram showing the electric constitution of the information processor 1. The information processor 1 is provided with the central processing unit (henceforth CPU) 21, and the keyboard 2, the liquid crystal display (LCD) 3, and the printing unit 18 are connected to CPU21. CPU21 controls LCD3 and the printing unit 18 based on the input from the keyboard 2. The memory 22 is connected to CPU21.

[0016]The memory 22 comprises RAM (random access memory) and a ROM (read-only memory). In RAM, the image memory in which the bit image data for one display screen of LCD3 is stored is contained. Based on the data of this image memory, the printing unit 18 performs printing to the thermographic recording paper 7 by the thermal head 10 by what is called a hard copy method. A program, various parameters, etc. for controlling the information processor 1 whole are stored in ROM.

[0017]Drawing 7 is a flow chart explaining fundamental operation of the information processor 1. It is judged whether information was inputted or not, and if information is inputted, in Step a2, input will be expressed to the liquid crystal display 3 as Step a1. At this time, bit image data required for a display is stored in the image memory in the memory 22.

[0018]It is judged in Step a3 whether the processing instruction was inputted. In Step a4, an input of a processing instruction will judge whether the inputted command is a print command. When it is a print command, it progresses to Step a5, and the printout of the display screen to the recording form 7 by the printing unit 18 is performed. Printing operation is performed based on the bit image data stored in said image memory.

[0019]In Step a6, it is judged whether it ends or not, when not ending, it returns to Step a1, and it waits for the input of the following information. When ending, processing is ended by turning off the power supply of the information processor 1, for example.

[0020]In Step a4, when the inputted command is not a print command, in Step a7, processing corresponding to the input command is performed, and it progresses to Step a6 after that.

[0021]According to this example, the comparatively small information processor 1 is realizable as mentioned above by allocating the liquid crystal display 3 and the printing unit 18 in the same housing 4. Since it has the width for one line of the thermographic recording paper 7 and two or more heating resistors are provided along the cross direction, the thermal head 10 which constitutes the printing unit 18 does not need to form the drive mechanism for moving the thermal head 10 to a line writing direction, and it becomes possible to have smaller composition. By development of a thin film technology in recent years, thin-type-izing of the liquid crystal display 3 and a thermal head is possible enough.

[0022]Printing to the thermographic recording paper 7 by the thermal head 10, Since it is performed

by what is called hard copy method based on the bit image data stored in the image memory, it is not necessary to provide a memory new for printing control, and simplification and a miniaturization of composition are attained also in the field of electric constitution.

[0023]It may carry out about the printing unit which performs printing, not only the printing method to the thermographic recording paper 7 by the thermal head 10 but other printing methods, for example, the chemicals print paper by a chemical head.

[0024]

[Effect of the Invention]According to this invention, it becomes possible to constitute a display and a printer in one in an information processor, and to miniaturize the composition as mentioned above.

[0025]In the information processor of this invention, it is possible between a liquid crystal display and a printer to share a drive circuit, and the miniaturization of composition can be attained also with this point.

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[Translation done.]